ABSTRACT

The specification discloses a signal processing technique applicable in acoustic logging devices. The method involves receiving a set of acoustic signals and converting those received signals to their frequency domain representation. Values of the frequency domain representations along constant frequencies are correlated to produce a correlation matrix. Eigenvectors and eigenvalues of the correlation matrix are determined, and the eigenvectors corresponding to signals of interest are removed to create a subspace. Thereafter, a series of test vectors, which test vectors embody a series of estimated slowness values, are applied to the subspace vector. If the test vector maps to or may be represented by the subspace, then the estimated slowness embodied in the test vector maps to noise of the system and is not the correct value for the formation. If, however, the test vector does not map to the subspace, then the slowness embodied in the test vector approximates the actual formation slowness.